

**ABSTRACT**

The present invention is related to a composite sheet material, a method of producing this material, and the application of this material as a sensor for monitoring and measuring shear forces (or lateral translation). In one embodiment, the present invention includes a composite sheet material having an upper and a lower surface comprising an elastomeric matrix, which is essentially non-conductive, and discrete electrically conductive elements within the matrix wherein the electrically conductive elements in a region of the composite sheet material are arranged into columns, and the orientation of these columns are in an essentially organized, non-random pattern with a majority of these columns oriented at angles less than about 90° and greater than about 15° to the lower surface of the composite sheet material. In another embodiment, the present invention provides for a method of forming the sensors.